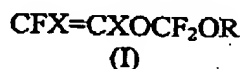


AGENT  
 Ser. No. 09/840,527  
 Atty Docket No. 2581/10

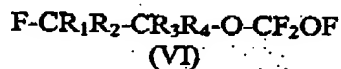
IN THE CLAIMS:1. - 20 (*Cancelled*)21. (*Presently Amended*) A process for making a fluorovinyl ether of formula

wherein:

- 1) R is a C<sub>2</sub>-C<sub>6</sub> linear or branched perfluoroalkyl group, a C<sub>5</sub>-C<sub>6</sub> cyclic perfluoroalkyl group, or a linear or branched perfluorooxyalkyl group comprising 2 to 6 carbon atoms and 1 to 3 oxygen atoms;
- 2) up to two fluorine atoms of the perfluoroalkyl group or the perfluorooxyalkyl group can be independently replaced with an atom selected from the group consisting of H, Cl, Br, and I; and
- 3) X is F or H;

comprising the steps of

- a) contacting hypofluorite, CF<sub>2</sub>(OF)<sub>2</sub>, with a first olefin of structure R<sub>1</sub>R<sub>2</sub>C=CR<sub>3</sub>R<sub>4</sub>, wherein R<sub>1</sub> and R<sub>4</sub> are the same or different and selected from H and F, and R<sub>2</sub> and R<sub>3</sub> are the same or different and selected from H and Cl, to form a first intermediate hypofluorite of structure



and

- b) contacting the first intermediate hypofluorite (VI) with a second olefin having structure R<sub>5</sub>R<sub>6</sub>C<sup>1</sup>=C<sup>2</sup>R<sub>7</sub>R<sub>8</sub> to form a second intermediate hypofluorite



wherein R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are F; or one of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> is a C<sub>1</sub>-C<sub>4</sub> linear or branched perfluoroalkyl group and the others of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are F; or one of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> is a C<sub>1</sub>-C<sub>4</sub> linear or branched perfluorooxyalkyl group containing from one to three oxygen atoms and the others of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are F; or either pairing R<sub>5</sub> and R<sub>7</sub> or R<sub>6</sub> and R<sub>8</sub>, together with the carbon atoms to which they are attached, are linked

TENT

Ser. No. 09/840,527

Atty Docket No. 2581/10

to form a perfluorinated C<sub>5</sub>-C<sub>6</sub> cycloalkyl group and the others of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> not so linked are F;

and

c) when R<sub>2</sub> and R<sub>3</sub> are both Cl, subjecting the second intermediate (VII) to a dehalogenation reaction, or, when one of R<sub>2</sub> and R<sub>3</sub> is H, subjecting the second intermediate (VII) to a dehydrohalogenation reaction;

with the proviso that when one of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> or R<sub>8</sub> is a C<sub>2</sub>-C<sub>4</sub> linear or branched fluoroalkyl group or a C<sub>2</sub>-C<sub>4</sub> linear or branched fluoroalkoxy group comprising from one to three oxygen atoms; then one or two of the remaining three of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are F and the remaining one or two of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> are selected from H, Cl, Br, and I, with the proviso that, where only one of said remaining three of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> is F, then the remaining two of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> are the same and linked to the same carbon atom; and further with the proviso that when R<sub>5</sub> and R<sub>7</sub> together with the carbon to which they are attached, or R<sub>6</sub> and R<sub>8</sub> together with the carbon atom to which they are attached, are linked to form a cyclic then one of the remaining two of R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> is F and the other is selected from H, Cl, Br, and I.

22. The process of claim 21 wherein the second olefin is reacted with hypofluorite in place of first olefin and the first intermediate hypofluorite is then reacted with the first olefin.

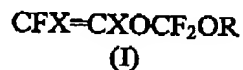
23. The process of claim 21 wherein the contacting is in a continuous process in which the mole amount of hypofluorite contacted is equal to or greater than the mole amount of first olefin R<sub>1</sub>R<sub>2</sub>C=R<sub>3</sub>R<sub>4</sub> contacted and further wherein the residence time in the reactor is between about 0.05 and about 120 seconds, the temperature is between about -40° and about -150°C, and the first intermediate hypofluorite of the reaction of the first olefin with hypofluorite is continuously reacted with the second olefin.

24. (*Presently Amended*) A process according to claim 21 wherein the concentration of second olefin R<sub>5</sub>R<sub>6</sub>C=CR<sub>7</sub>R<sub>8</sub> R<sub>5</sub>R<sub>6</sub>C<sup>2</sup>=C<sup>1</sup>R<sub>7</sub>R<sub>8</sub> is constant and greater than about 0.01M and the temperature is between about -20°C to -100° C.

TENT  
 Ser. No. 09/840,527  
 Atty Docket No. 2581/10

25. The process of claim 24 wherein the concentration of second olefin is equal to or greater than about 3M.

26. (Presently Amended) In a process for making a fluorovinyl ether of structure:



wherein:

- 1) R is a C<sub>2</sub>-C<sub>6</sub> linear or branched perfluoroalkyl group, a C<sub>5</sub>-C<sub>6</sub> cyclic perfluoroalkyl group, or a linear or branched perfluorooxyalkyl group comprising 2 to 6 carbon atoms and 1 to 3 oxygen atoms;
- 2) up to two fluorine atoms of the perfluoroalkyl group or the perfluorooxyalkyl group can be independently replaced with an atom selected from the group consisting of H, Cl, Br, and I; and
- 3) X is F or H;

the step of:

contacting a first fluoroalkene with a hypofluorite to form a first intermediate;  
 then contacting the first intermediate with a second fluoroalkene to form a second intermediate;

1) the hypofluorite is of structure X<sub>1</sub>X<sub>2</sub>C(OF)<sub>2</sub> wherein X<sub>1</sub> and X<sub>2</sub> are the same or different and selected from F and CF<sub>3</sub>; and

2) the first and second fluoroalkenes may be the same or different and are selected from R<sup>A</sup><sub>1</sub>R<sup>A</sup><sub>2</sub>C=CR<sup>A</sup><sub>3</sub>R<sup>A</sup><sub>4</sub> and R<sup>A</sup><sub>4</sub>R<sup>A</sup><sub>5</sub>C=CR<sup>A</sup><sub>7</sub>R<sup>A</sup><sub>8</sub> wherein each of R<sup>A</sup><sub>1</sub>, R<sup>A</sup><sub>2</sub>, R<sup>A</sup><sub>3</sub>, R<sup>A</sup><sub>4</sub>, R<sup>A</sup><sub>5</sub>, R<sup>A</sup><sub>6</sub>, R<sup>A</sup><sub>7</sub>, and R<sup>A</sup><sub>8</sub> are the same or different and are selected from the group consisting of H, F, Cl, Br, I, -CF<sub>2</sub>OSO<sub>2</sub>F, -SO<sub>2</sub>F, -C(O)F, C<sub>1</sub>-C<sub>5</sub> linear or branched perfluoroalkyl, and linear or branched oxyperfluoroalkyl.